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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/560,992	12/14/2005	Sung-Kyu Kang	75609/RSM	9153
23432	7590	02/05/2008		
COOPER & DUNHAM, LLP 1185 AVENUE OF THE AMERICAS NEW YORK, NY 10036			EXAMINER AKRAM, IMRAN	
			ART UNIT 1795	PAPER NUMBER
			MAIL DATE 02/05/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/560,992

Applicant(s)

KANG ET AL.

Examiner

IMRAN AKRAM

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) 1-5 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-11 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-5, drawn to an apparatus for low-temperature catalytic gasification.

Group II, claim(s) 6-11, drawn to a method of low-temperature catalytic gasification.

2. The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the shared technical features between the Groups of a fuel supplier and screw feeder, a catalytic fluidized bed gasifier with hot air and steam, a dust collector, a catalytic reformer, a heat exchanger, a tar scrubber, and a gas-holder are anticipated by Kaneko (US 2002/0159929 A1) and are therefore not a special technical feature. Group I has the special technical feature of a fuel hopper and the location of the fluidized-bed and pipes in the hopper which is not recited in the invention of Group II.

3. During a telephone conversation with Richard Milner on 1/29/08 a provisional election was made without traverse to prosecute the invention of Group II, claims 6-11. Affirmation of this election must be made by applicant in replying to this Office action.

Art Unit: 1795

Claims 1-5 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

4. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

Art Unit: 1795

were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 6-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ekstrom (US 5,213,587) in view of Kaneko (US 2002/0159929 A1).

9. Regarding claim 6, Ekstrom discloses: a fuel supplying step of supplying a refined mixture including biomass organic waste (column 1, lines 31-35), coal (column 1, lines 63-65), and heavy oil (column 1, lines 14-18) to a middle portion of a gasifier (see abstract); a catalytic circulating fluidized-bed gasification step of drying (column 5, lines 51-54), volatilizing and low-temperature catalytic gasifying (column 1, lines 31-35), and partially burning the fuel using hot air and superheated steam in the presence of a catalyst (column 2, lines 46-47); a collecting step of collecting dust in the gas generated in the catalytic circulating fluidized gasification step (column 3, lines 10-19); a catalyst reforming step of reforming the gas through a lower layer of fixed adsorbent bed and the refined mixture through an upper layer of fluidized catalyst bed (column 3, lines 49-61); a heat exchanging step of cooling the gas to 200°C or less (column 5, lines 17-22) and transferring condensed liquid to a tar-storing bath (see abstract); a tar scabbing step of condensing non-converted tar or non-condensed liquid to be recovered, and gas stripping the condensed liquid (column 2, lines 24-31); and a gas-storing step of compressing the gas (column 6, lines 3-8). Reforming tar-nitrogen, aromatic-nitrogen,

Art Unit: 1795

phosphorous, and sulfur through the upper layer of fluidized catalyst bed is inherent to the process of Ekstrom as these are all constituents and byproducts of the reaction fuels. Also, gas product storage is inherent as the product would need to be put somewhere. What Ekstrom does not disclose, however, is the use of a screw feeder for fuel injection into the gasifier. Screw feeders are well known injection means in the art as can be found in Kaneko. Kaneko discloses a gasification process that uses a screw feeder for the fuel hopper (paragraph 103). While Kaneko teaches away from a fluidized reaction bed, the use of screw feeder of Kaneko does not prevent its use in Ekstrom. It would have been obvious to one having ordinary skill in the art at the time of invention to incorporate for screw feeder of Kaneko with the fuel insertion means of Ekstrom in order to allow fuel injection through desirably different angles of insertion (see paragraph 105 of Kaneko).

10. Regarding claim 7, Ekstrom discloses the active material to be calcium-magnesium carbonate (column 4, lines 25-30).

11. Regarding claim 8, Ekstrom discloses circulation by cyclone means (column 4, lines 3-18).

12. Regarding claim 9, while Ekstrom discloses reformation temperature to be below 650°C (column 5, lines 8-16), Ekstrom does not disclose the use of steam spraying or the prevention of clogging. Kaneko, however, as an aforementioned analogous invention, discloses the use of steam spraying (paragraph 403) and the importance of avoiding clogging in the line (paragraph 569). It would have been obvious to one having

Art Unit: 1795

ordinary skill in the art at the time of invention to use steam spraying as to prevent line clogging since clogging would adversely affected the process in a negative way.

13. Regarding claim 10, Ekstrom does not disclose the removal of hydrogen sulfide by absorption (column 1, lines 51-65). Since the active material is calcium the creation of calcium sulfide is inherent, as is the creation of a phosphorous halide.

14. Regarding claim 11, Ekstrom discloses the decomposition of tar into alkene compounds and ammonia using a catalytic material (column 4, lines 39-48), but fails to specify if the catalyst can be a single metal catalyst. Kaneko, however, discloses the use of a nickel catalyst for tar decomposition (paragraph 224). It would have been obvious to one having ordinary skill in the art at the time of invention to use a nickel catalyst that Kaneko discloses for the conversion of tar that Ekstrom teaches since the nickel catalyst converts the tar. The catalyst of Kaneko is capable of use with Ekstrom, with or without the fluidized bed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to IMRAN AKRAM whose telephone number is (571)270-3241. The examiner can normally be reached on 10-7 Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1795

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

IA


ALEXA D. NECKEL
SUPERVISORY PATENT EXAMINER